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| APPLICATION NO.                  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|----------------------------------|-------------|----------------------|---------------------|------------------|
| 10/028,257                       | 12/19/2001  | Larry J. Carson      | 55578US002          | 2327             |
| 32692                            | 7590        | 12/31/2003           | EXAMINER            |                  |
| 3M INNOVATIVE PROPERTIES COMPANY |             |                      | SINES, BRIAN J      |                  |
| PO BOX 33427                     |             |                      |                     |                  |
| ST. PAUL, MN 55133-3427          |             |                      | ART UNIT            | PAPER NUMBER     |
|                                  |             |                      | 1743                |                  |

DATE MAILED: 12/31/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/028,257

Applicant(s)

CARSON ET AL.

Examiner

Brian J. Sines

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-45 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 6-19, 24, 26-38, 40 and 42-45 is/are rejected.
- 7) ☒ Claim(s) 4, 5, 20-23, 25, 39 and 41 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 – 3, 6, 8 – 13 and 30 – 37 are rejected under 35 U.S.C. 102(b) as being anticipated by Anazawa *et al.* (U.S. Pat. No. 5,938,908 A). Regarding claims 1 – 6, 8 – 10 and 30 – 37, Anazawa *et al.* teach an apparatus comprising an elongate lightguide (optical cell 5 comprising transparent glass plates); an array of grooves or conduits (capillaries 1 comprising quartz glass and having a substantially circular cross-section) extending through the light guide, wherein the conduits are configured to support a migration medium (gel, 20); and wherein the lightguide and its surrounding medium have refractive indices selected such that light entering the light guide is internally reflected within the lightguide to illuminate the conduits. Optical cell 5 comprises a single construction covering both sides of the array of capillary tubes (see col. 5, line 65 – col. 7, line 35; figure 4). Regarding claims 11 and 37, Anazawa *et al.* teach the use of capillaries made of fused silica (see col. 1, lines 10 – 27). Regarding claim 12, the light enters the lightguide in a direction substantially coplanar to the longitudinal axes of the conduits (see figures 1 – 4). Regarding claim 13, the lightguide, which comprises transparent glass plates, inherently has a higher refractive index compared to the surrounding medium (*e.g.*, air) (see col. 6, line 1 – col. 7, line 65).



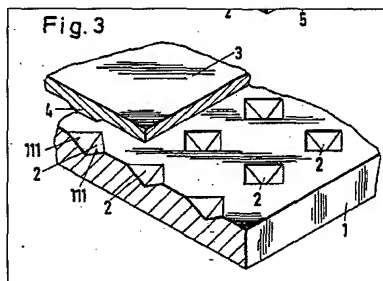
Claims 14, 16 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Ishikawa (U.S. Pat. No. 5,061,029). Ishikawa teaches an optical waveguide apparatus structure comprising: a cover (4) on a substrate (base, 3); and an array of substantially parallel grooves (6), which are substantially coplanar (see col. 2, line 45 – col. 4, line 57; figures 1(A) – 1(E)).



Claims 14 – 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Kroy *et al.* (U.S. Pat. No. 5,252,294 A). Kroy *et al.* teaches an apparatus structure comprising: a cover (3)

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on a substrate (1), wherein the substrate comprises an array of substantially parallel grooves (2), wherein the grooves are substantially coplanar and are configured to support a migration medium (see col. 2, lines 35 – 46; figure 3). The cavities (2) may be either square or circular (see col. 3, lines 9 & 10). The apparatus may be used with optical detection methods (see col. 4, lines 48 – 65).



Claims 18, 19, 24, 28, 29, 40 and 42 – 45 are rejected under 35 U.S.C. 102(b) as being anticipated by Dhadwal *et al.* (U.S. Pat. No. 5,790,727 A). Dhadwal *et al.* teach an apparatus comprising: an elongate lightguide (88) comprising a solid substrate (96) having an array of grooves (98); a cover on the substrate; and a light source (92) (see col. 22, lines 7 – 51; figure 9). The detector is optically coupled with the lightguide portion using a spectrograph (142) (see col. 19, lines 23 – 33; figure 10(a)). Dhadwal *et al.* teach the positioning of capillaries (94) within grooves (98) (see figure 9). Dhadwal *et al.* teach the use of cladding, which confines the light beam to the interior of the structure comprising the lightguide portion (see col. 10, lines 5 – 67). Dhadwal *et al.* teach the incorporation of two light sources (92) (see col. 2, lines 49 – 58; figure 9). Regarding claims 29 and 44, Dhadwal *et al.* teach that their disclosed system is used in the fluorescent emission detection of labeled DNA molecules during analysis (see col. 1, lines 8 –

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25). As discussed above, Dhadwal *et al.* teach all of the structure of the apparatus provided in the claimed method, which merely recites the conventional operation of that apparatus.

Regarding process or method claims, a prior art device anticipates a claimed process, if the device carries out the process during normal operation (see MPEP § 2112.02). The Courts have held that when a prior art device is the same as a device described in the specification for carrying out the claimed method, it can be assumed that the device will inherently perform the claimed process. See *In re King*, 801 F.2d 1324, 231 USPQ 136 (Fed. Cir. 1986).

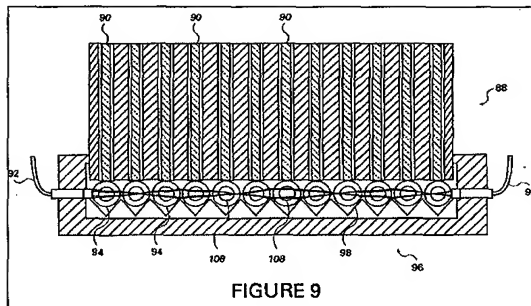


FIGURE 9

### Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459

(1966), that are applied for establishing a background for determining obviousness under 35

U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

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2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Anazawa *et al.* in view of Mizuno *et al.* (U.S. Pat. No. 6,542,691 B2). Anazawa *et al.* do not specifically teach that the conduits can have substantially square cross-section. Anazawa *et al.* do teach that their disclosed system is used in fluorescence detection (see col. 2, lines 9 – 41). Mizuno *et al.* do teach the use of glass capillary tubes having a square cross-section and their advantages in fluorescence analysis (see col. 1, lines 34 – 50). Hence, a person of ordinary skill in the art would accordingly have had a reasonable expectation of success in modifying the apparatus of Anazawa *et al.* to incorporate the glass capillary tubes having a square cross-section, as taught by Mizuno *et al.* (see MPEP § 2143.02). Therefore, it would have been obvious to a person of ordinary skill in the art to incorporate the use of glass capillary tubes having a square cross-section, as taught by Mizuno *et al.*, with the apparatus of Anazawa *et al.*, in order to facilitate better apparatus performance during detection.

Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dhadwal *et al.* in view of Anazawa *et al.* (U.S. Pat. No. 5,938,908 A). Dhadwal *et al.* do not specifically teach that the substrate is composed of fused silica or borosilicate. Anazawa *et al.* do teach that apparatus used in optical detection devices, such as capillaries, are made of fused silica (see col. 1, lines 10 – 27). The Courts have held that the selection of a known material based upon its intended use is within the ambit of a person of ordinary skill in the art. See *In re Leshin*, 125 USPQ 416 (CCPA 1960) (see MPEP § 2144 & § 2144.07). Therefore, it would have been

obvious to a person of ordinary skill in the art to incorporate the use of fused silica, as taught by Anazawa *et al.* with the apparatus of Dhadwal *et al.*

Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dhadwal *et al.* in view of Ishikawa (U.S. Pat. No. 5,061,029). Dhadwal *et al.* do not specifically teach that the substrate and the cover are composed of a polymer material. Ishikawa teaches an optical apparatus comprising a substrate (base, 3) and cover (4) composed of a polycarbonate polymer resin (see col. 2, lines 45 – 68). The Courts have held that the selection of a known material based upon its intended use is within the ambit of a person of ordinary skill in the art. See *In re Leshin*, 125 USPQ 416 (CCPA 1960) (see MPEP § 2144 & § 2144.07). Therefore, it would have been obvious to a person of ordinary skill in the art to incorporate the use of a polymer material, as taught by Ishikawa with the apparatus of Dhadwal *et al.*

Claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over Anazawa *et al.* in view of Giallorenzi *et al.* (U.S. Pat. No. 3,963,310). Anazawa *et al.* do not specifically teach that the lightguide is composed of polymethylmethacrylate. Giallorenzi *et al.* teach an optical waveguide or light guide structure composed of polymethylmethacrylate (see col. 5, lines 14 – 20). The Courts have held that the selection of a known material based upon its intended use is within the ambit of a person of ordinary skill in the art. See *In re Leshin*, 125 USPQ 416 (CCPA 1960) (see MPEP § 2144 & § 2144.07). Therefore, it would have been obvious to a person of ordinary skill in the art to incorporate the use of polymethylmethacrylate, as taught by Giallorenzi *et al.*, with the apparatus of Anazawa *et al.*



***Allowable Subject Matter***

Claims 4, 5, 20 – 23, 25, 39 and 41 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: Regarding claim 4, the cited prior art neither teach or fairly suggest the further incorporation of a reflective third interior surface. Regarding claim 20, the cited prior art neither teach or fairly suggest the incorporation of an apparatus to produce a light beam which is decollimated. Regarding claim 25, the cited prior art neither teach or fairly suggest the further incorporation of the substrate further comprising a reflective interior surface to reflect the light emitted by the source back into the lightguide. Regarding claim 39, the cited prior art neither teach or fairly suggest the further incorporation of a mirror as the third interior surface. Regarding claim 41, the cited prior art neither teach or fairly suggest the further incorporation of at least one substrate and the cover further comprising a reflective surface to reflect light entering the lightguide from the second direction.

***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Herron *et al.* (U.S. Pat. No. 6,611,634 B2) teach an optical biosensor comprising a waveguide and a sample reservoir. Gorfinkel *et al.* (U.S. Pat. No. 6,464,852 B1) teach a multichannel electrophoresis apparatus for fluorescent detection. Siebert *et al.* (U.S. Pat. 6,613,212 B1) teach a multiple capillary electrophoresis system. Herron *et al.* (U.S. Pat. No.

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5,677,196 A) teach an apparatus comprising a planar waveguide used in performing fluoroimmunoassays.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian J. Sines whose telephone number is (703) 305-0401. The examiner can normally be reached on Monday - Friday (11:30 AM - 8 PM EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill A. Warden can be reached on (703) 308-4037. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9310.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

  
Jill A. Warden  
Supervisory Patent Examiner  
Technology Center 1700